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Regional Meeting on Socio-Economic and Policy Aspects of Water Resources Management in Africa

Addis Ababa (Ethiopia), 2-6 June 1986

REPORT OF THE MEETING

1. The Regional Meeting on Socio-Economic and Policy Aspects of Water Resources Management in Africa was organized jointly by the secretariat of the Economic Commission for Africa (ECA), and the United Nations Educational, Scientific and Cultural Organization (UNESCO). It was held in Addis Ababa, Ethiopia, from 2 to 6 June 1986.

Attendance

2. The meeting was attended by participants from Benin, Burundi, Congo, Côte d'Ivoire, Egypt, Ethiopia, Gambia, Ghana, Guinea, Guinea Bissau, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Uganda, United Republic of Tanzania and Zambia. Representation from the United Nations system organizations included the Department of International Economic and Social Affairs, the United Nations Centre for Human Settlement, United Nations Development Programme, United Nations International Children Fund, United Nations Environment Programme, United Nations International Research and Training Institute for the Advancement of Women, United Nations Sudano-Sahelian Office, International Labour Organization, Food and Agriculture Organization of the United Nations, World Meteorological Organization and World Bank.

Opening of the meeting

3. The meeting was opened by Mr. Tchouta Moussa, Deputy Executive Secretary of the Economic Commission for Africa. In the course of his opening address, he welcomed the participants on behalf of the Executive Secretary, Professor Adebayo Adedeji. He emphasized the importance of the meeting in the light of the call for accelerated action in water resources development by the United Nations Water Conference nearly ten years ago, later endorsed by the Lagos Plan of Action and of the call for the achievement of the goals of International Drinking Water Supply and Sanitation Decade launched by the General Assembly in 1980. Despite the efforts being made by African Governments and external support agencies, so many of the severe problems affecting the African region have eroded the progress being made and pushed the achievement of the goals and targets a little further away every day. In drawing attention to the African Priority Programme for Economic Recovery (APPER) which was presented to the Special Session of the General Assembly on the Critical Economic Situation in Africa, he indicated the importance of water resources development and management in its implementation and the need to use the priority programme as a framework for the deliberations of this meeting.

4. Mr. Awad Idris, UNESCO representative to Ethiopia and Liaison Officer to ECA and OAU, welcomed the participants to the meeting on behalf of the Director General of UNESCO, Mr. Amadou M. M'bow. He reiterated the role that water resources development plays in enhancing the socio-economic progress of the African people and the importance of this meeting in providing solutions to the problems confronting the region.

Election of Officers

5. The following officers were elected unanimously. Chairman, Mr. Melaku Endamamaw (Ethiopia); Vice-Chairman, Mr. Mustapha Kane (Mauritania); Rapporteurs, Ms. Toks Ogbe (Nigeria), Mr. Vincent P. Lokrou (Côte d'Ivoire), Dr. Ikhemeno Oteri (Nigeria), Mr. Mustapha Kane (Mauritania) and Dr. Shafika Nasser (Egypt) were elected as chairpersons for working groups A, B, C and D respectively. Mr. Nii Boi Ayibotele (Ghana), Dr. B.O. Arthur Gilpin (Sierra Leone), Mr. Jubril A. Hamidu (Nigeria), and Mr. John Pickford (United Kingdom) acted a resource persons for each of the working groups respectively.

Adoption of the agenda and organization of work

6. The participants adopted the following agenda:

1. Opening of the meeting
2. Election of officers
3. Adoption of the agenda and organization of work
4. Statements by the organizing agencies
5. Keynote speeches
6. Country papers
7. Statements by United Nations organizations and agencies
8. Discussion of issues concerning:
   (a) planning and management of water resources and their assessment;
   (b) education, training and research;
   (c) the role of water resources in national socio-economic development;
   (d) environmental and health aspects.
9. Future regional co-operation activities
10. Consideration of draft report
11. Consideration of draft recommendations to be included in the final report
12. Closure of the meeting.

7. Each of the major topics under agenda item 8 was discussed in a working group, which later presented its recommendations to the meeting.

Agenda item 4. Statements by the organizing organizations

8. A representative of the ECA secretariat drew further the attention of participants to the status of water resources development in Africa, in the light of the social and economic crisis in Africa which had largely negated the progress made since 1977 in the implementation of the Mar del Plata Action Plan.

9. Nevertheless, in the light of the resolve by African governments to implement the programme for economic recovery, it was the task of the meeting to identify for national economic planners the priority areas for action in the field of water resources development.

10. In formulating its recommendations, the working groups should give emphasis to measures to be implemented by African Governments themselves and to the means of generating their own internal financial and human resources.

11. The UNESCO Regional Hydrologist for Africa emphasized the importance of water resources management, the development of joint, economically-viable projects dependent on water between countries sharing common waters, aimed at a sustainable growth of the economy of the subregions of Africa. He drew attention to the need for the development of the necessary human resources in water legislation and research and to the need for joint economic interlinking of projects related to water resources. He called for increased regional co-operation among the countries themselves, as well as by the organizations of the United Nations system and other regional and bilateral organizations. He further recommended the establishment of the African Network/Centre for water resources studies, research and development in Africa; and this type of meeting should be considered as a continuous educational process which should be hosted every 2 or 3 years, treating other related topics, assessing progress made on previous recommendations, and endeavouring to reach as many people as possible.

12. Dr. Shafika Nasser (Egypt), addressed the participants on behalf of the Director of the United Nations International Research and Training Institute for the Advancement of Women (INSTRAW), Ms. Dunja Pastizzi-Ferencic. She expressed her confidence that the meeting would contribute towards a better understanding of the socio-economic and policy aspects of water resources management, and in doing so seek ways to enhance the role of women in water supply and sanitation. She recalled the mandates given to governments and to the international community alike through the Forward-Looking Strategies adopted by World Conference to Review and Appraise the Advancements of the United Nations Decade for Women, in July 1985, to change the perspective of development for the betterment of society, by enhancing the role of women in socio-economic development. In this respect, she noted that the role of women as agents in the planning, implementation and administration of drinking water supply and sanitation had been underscored by the Conference.

Agenda item 5: Keynote speeches

13. A keynote speaker addressed the meeting on each of the main topics to be considered under agenda item 8 as a means of providing a framework for the ensuing discussions. A summary of these speeches is provided below.

A. PLANNING AND MANAGEMENT OF WATER RESOURCES AND THEIR ASSESSMENT

14. This paper was presented by Mr. Nii Boi Ayibotele (Ghana).

15. The paper drew attention to the social, economic, political and climatic conditions in which the Mar del Plata Action Plan has been implemented in the African region. It recalled the recommendations of the African Regional Preparatory Meeting and the UN Water Conference in respect of national water policy, institutional management, legislation and public participation. It then reviewed the progress and constraints in the implementation of the recommendations. It concluded that though there have been a few achievements, the region on the whole has not fared well. It noted that the constraints of manpower, finance and know-how are still much with this region as they were in 1977. It suggested that these constraints be looked at in the totality of the constraints in the national economies. In this regard, attention must also be paid to the state of the global economy, so realistic targets may be set. Institutional and legislative arrangements should be kept constantly under review, so that new institutions may be established and new laws enacted in response to changing needs. On water resources assessment, it was suggested that co-ordination should be effected at the national, subregional and regional levels. The primary responsibility lies at the national level, where the initiations must start. It was also recommended that countries which have already not done so, should apply the UNESCO/WMO guide to evaluate their national water resources assessment activities.

B. TRAINING AND RESEARCH FOR WATER SUPPLY DEVELOPMENT IN AFRICA

16. This paper was presented by Dr. E.O. Arthur Gilpin (Sierra Leone) on behalf of Dr. Eustace Gondwe (Tanzania).

17. African countries have set their respective target dates to supply their people with safe water according to the International Drinking Water Supply and Sanitation Decade (IDWSSD). Few African countries would be able to supply all their people with safe water before the year 2000. The original target set by the IDWSSD will not be fulfilled because of inadequate funds and trained manpower for the water supply and sanitation programmes.

18. The sophistication of many water supply schemes dictates the level of competence of manpower that is required for both urban and rural water supply programmes. There are two types of training required.

19. First, the training of engineers practising in the field. This training is obtained by experience. The engineers or technicians would have been trained as civil engineers under an undergraduate or post-graduate curriculum in a university or a polytechnic. Occasionally, the university-trained water specialists are not prepared to work in the rural areas and they end up working in urban programmes.

20. Secondly, water technicians are trained in middle level institutions for periods ranging from one to three years. Minimum requirements for acceptance for training is ordinary-level certificate. These technicians do not spend all their training period in design offices but are trained mainly to maintain the water systems. They are trained by engineers and they develop the attitudes of engineers and end up trying to become engineers. Thus, they do not appreciate the pride in being good technicians.

21. Pump attendants and plumbers, who are required for rural water supply programmes, should be trained in the villages and should come from the populations of the villages. These artisans are trained for only short periods by visiting technicians or engineers. Because of the inadequate period of training, African countries spend huge funds to rehabilitate water supply schemes which have deteriorated under the responsibility of these artisans.

22. Research into relevant procedures for water supply programmes in Africa is very necessary. The quantity and quality of water resources in Africa must be established before exploitation. Appropriate technologies have to be developed because parameters used in designs are those from developed countries with different climatic and environmental conditions. Therefore, Africa must establish its own design parameters.

23. Theoretical and applied research are urgently required for the proper development and improvement of water supply schemes. Theoretical research in universities helps practical application and such research could now be carried out speedily by computers. All African countries, therefore, should gear their work to new innovations in the technology of water supply.

24. Applied research could be carried out by practising engineers and water scientists at their places of work because of readily available data. These engineers could obtain water consumption per capita and could also evaluate the quality of potential water resources in order to maintain required standards. They could investigate the effects of the quality of water on the health of the people. At this time, most African countries have over twenty years data to carry out research on the technology of water supply schemes. The technology should be of reasonable cost and should depend on the availability of energy sources.

25. This presentation was supplemented by a description of INSTRAW's current programme on training. The representative of INSTRAW described how two prototype training modules had been prepared at the ILO/Turin Training Centre on 'Women, Water Supply and Sanitation'.

26. One of these modules was later shown to the meeting and comments on it were invited from participants.

C. ROLE OF WATER RESOURCES IN NATIONAL SOCIO-ECONOMIC DEVELOPMENT

27. This paper was presented by Mrs. Toks Ogbe, (Nigeria) on behalf of Mr. J.O. Sonuga (Nigeria).

28. Water plays important roles in enhancing our standards of living and in ensuring more tolerable conditions of existence. It influences the economic conditions of the country. Certain constraints including manpower shortages, the lack of adequate funds, a low level of technological development and natural causes have not allowed the realization of the full import of water resources development in the developing countries of Africa.

29. Water resources, if properly planned and implemented, will bring about massive socio-economic changes which can lead the country to self-sufficiency in food production (especially through irrigation schemes) and a self-sustaining economic growth.

30. Water resources development, therefore, requires careful attention to provide full socio-economic benefits. The river basin approach is advocated along with preparation of basin-wide master plans based on simulation models, which are to be strictly adhered to at all phases of implementation. An established institutional organization should be responsible for the overall development (planning, implementation and management) related to water and land within the river basin. Effective co-operation among countries sharing a major basin is very essential. Long-term measures to combat the economic crises and natural disasters affecting the African countries certainly involve adequate water resources development in the affected areas. In view of human suffering, water resources development (including inter-basin transfers) should be evaluated not only on the basis of cost-effectiveness but also on the other sociological factors, some of which are difficult to quantify.

D. ENVIRONMENTAL AND HEALTH ASPECTS

31. This paper was presented by Professor John Pickford (United Kingdom).

32. Drinking water sources far from habitation bring a terrible burden to women and others. Polluted water, even in abundance, can be a danger to life and bring immense misery due to disease. In Africa bilharzia, guinea worm, diarhoea and intestinal worms are common, especially in rural areas and underprivileged urban communities. Guinea worm disease can be eradicated by fairly simple and inexpensive measures, and the incidence of roundworm and hookworm (which waste scarce food) can be drastically reduced by adequate sanitation. Drinking water quality should conform to the new WHO guidelines which are appropriate for small communities in developing countries.

33. Appropriate technology (especially handpumps and pit latrines) and community participation (especially at the planning stage) were stressed, both should be related to operation and maintenance, and institutions capable of financing works should be strengthened.

34. Apart from safe water and adequate excreta disposal, important environmental management measures required in Africa are collection and disposal of solid wastes, disposal of domestic wastewater and control of industrial effluent discharges. Consideration should always be given to potential advantages of undertaking many small projects rather than a few large ones.

Agenda Item 6: Country papers

35. Representatives of countries described the efforts made in their countries to implement the Mar del Plata Action Plan and to attain the goals of the International Drinking Water Supply and Sanitation Decade. They outlined the progress made nearly ten years after the United Nations Water Conference and the constraints faced in the accelerating water resources development activities. Many countries informed the meeting, that, despite the efforts made, there has not been any significant progress in the sector as a whole.

36. Some of the major reasons hampering or retarding progress were the prevailing economic conditions, low performance of the production sector, high interest rates, high debt servicing, high population growth rates, instability and the devastating effects of drought.

37. It was stated that many governments have taken steps to strengthen or rearrange their institutional frameworks. In many cases, the steps taken were not adequate since they did not accomodate the multi-dimensional aspects of the sector. Concerning policy issues, in a large majority of countries policies have been elaborated, priorities have been established and national water plans and programmes have been formulated as an integral part of the development process. Some countries, however, have also reported that responsibilities for water development rest within the ambits of many organizations and problems of proliferation of authority and lack of co-ordination was noted as a serious constraint. Some representatives stated that, in their countries, water resources development has regressed to a deplorable level. They informed the meeting that very basic issues such as institutional aspects, policy and planning are in a worse situation than when the United Nations Water Conference was held. For example the networks of hydrometeorological stations have fallen apart and much reguires to be done for any progress to be made.

38. While a number of countries reported that they are in the process of preparing water legislation, in many instances it was not comprehensive. Water legislation was lacking in many countries and, even where it exists, it is fragmented, inadequate and does not cover all sectors of water resources development.

39. The meeting noted that there is lack of basic water resources data both for planning and development purposes. It was reported that the quantity of surface water resources is better known than its quality. In the area of ground water resources assessment, there has not been any significant progress. Activities in this area are often limited to drilling of boreholes for drinking water supply. In view of the indispensability of basic data for water resources development, the participants called attention to the urgent need to conduct assessments of surface and ground water, in terms of both quality and quantity.

40. Community participation and mass education were reported to be receiving increasing attention. This has been carried out mainly in the areas of drinking water supply and sanitation and in the promotion of primary health care.

41. It was stated that many countries are making efforts to promote research, geared to development, that is suitable for their economic and social environments. The lack of adequately-trained, high-level manpower and finance, however, were mentioned as major constraints. Further, the need for co-ordination of research activities within the region is considered vital to optimize efforts, to avoid duplication, to minimize the waste of resources and to promote the exchange of knowledge and experience.

42. Many representatives elaborated on the environmental degradation arising from deforestation, overgrazing and soil erosion, culminating in the recent drought that took many lives and disturbed the whole ecosystem. It is noted that efforts are being made to restore an ecological equilibrium through the launching of land and water management programmes.

43. The meeting was informed about the problems of pollution arising from industrial waste disposal, insufficient action has been taken up until now because of the lack of legislation and of its effective enactment.

44. It was reported that considerable efforts in the area of drinking water supply and sanitation are being made. Despite these efforts, however, progress made falls far short of the targets of the International Drinking Water Supply and Sanitation Decade. In this context, attention given to sanitation is quite insignificant compared with drinking water supply.

45. In the presentations, it was reported that many countries are making efforts in the area of regional and subregional co-operation over their shared water resources. In this regard, a participant indicated a desire to take preliminary steps towards establishing an inter-governmental committee for the Nile Basin. Such a committee could assist the formulation of water regulations for the assessment, prevention, protection and control of the Nile Waters.

46. Representatives informed the meeting that efforts are also being made in the areas of agricultural water use, hydro-power generation, industrial water use and navigation. These efforts have often been limited by a number of constraints. From the discussion, it was noted that, depending on the status of economic development of the countries and the priorities attributed to the water sector, the degree of achievement may vary but the general trend indicated that the implementation of the Mar del Plata Action has not advanced satisfactorily.

47. Some of the constraints encountered, in addition to the major economic, political and natural calamities referred to previously, are the following:

(i) lack of finance is mentioned as a major common problem affecting all economic sectors;

(ii) manpower at all levels, and particularly at the management level, stands out as a constraint in the large majority of countries;

(iii) other problems relate to institutional weaknesses, absence or inadequacy of water legislation, high investment costs, problems of cost recovery in water supply projects, inadequate maintenance facilities, lack of continuity in plans and programmes and lack of training facilities.

Agenda item 7 Statements by United Nations Organizations and Agencies

48. The secretariat of the Economic Commission for Africa, as well as representatives of the various organizations of the United Nations system attending the meeting made brief presentations of their activities as they relate to the African region.

49. A representative of the United Nations Development Programme (UNDP)/World Bank Global Handpump Project later described some of the aspects of the work being carried out in Africa.

Agenda item 8: Recommendations from the working groups as adopted by the meeting

A. PLANNING MANAGEMENT AND ASSESSMENT OF RESOURCES

1. Planning

50. One of the constraints which has affected effective implementation of the Action Plan with respect to planning has been a lack of effective links or integrat of the water resources sector plans with national economic development plans. Whil a number of countries reported progress with the preparation of Master Water Plans or Perspective Plans, these have not been linked up properly with medium-term development plans. It is recommended that this constraint be covered by using priorities set by the national economic planning goals and targets.

51. The unavailability of suitable human and financial resources was identified again as one of the major constraints.

52. National planning seems ineffective because the multidisciplinary and inter-agency approach for effective formulation of plans have not been followed. Nationa governments are urged to pay attention to this and address this short-coming in their planning processes. The planning teams must be composed of experienced professionals. It is to be noted that the experience and capability of such teams will increase the ability of the countries to absorb external assistance.

53. One of the key constraints identified is financial. This has been so because realistic pricing policies have not been followed, so that costs of investments in water projects cannot be recovered. It must be pointed out that water is not a free commodity, and that if the question of cost recovery is not urgently addressed the trends are that the national economies will not be able to bear the cost of new developments or maintenance in the next two to four years. To avoid that crisis, water tariffs should be applied which will enable costs to be recovered for new developments.

54. In addition to this, other sources of internal resources must be mobilized. The rural sector should receive special attention in this regard to find innovative solutions. These solutions should be supported with the appropriate institutional and legal arrangements. It is recommended that the participation of rural communities and the use of appropriate technologies that reduce foreign exchange components of water projects will greatly help in this direction.

55. In order to make use of limited financial resources projects should be monitor as they are implemented to ensure proper accountability.

56. Other constraints identified with national policies and planning related to a lack of commitment by governments to adhere to plans, a lack of continuity in planning and implementing projects and in their evaluation. It is recommended, therefore, that the attention of governments be drawn to the fact that social and economic benefits that accrue from water resources development cannot be attained unless they show political will to commit themselves to plans, and give professiona the freedom that should be given to them to ensure that approved plans are implemented.

57. Another constraint identified was the weakness of the data bases of the national economic and water sector plans. It is recommended that for the plans to be realistic and reflect the true national situation the capabilities of the variou

agencies and organizations responsible for data collection and monitoring be considerably improved. In this regard, the case of the International Drinking Water Supply and Sanitation Decade needs special attention. The international organizations could be required to assist in this.

58. It was noted that there was the need to sensitize the international and bilateral organizations to the plans and priorities of the countries of the region, and a dialogue between governments and the organization is necessary.

59. It was recommended, therefore, and that the current consultations between the national governments, UNDP, World Bank and other bilateral and multilateral agencies aimed at resolving, planning, financing, implementing, monitoring and evaluating issues be strengthened and continued.

2. Institutional arrangements

60. Two types of institutional arrangements exist in the countries. There are countries with centralized institutions with responsibility and control of all aspects of water resources planning and management under them. In such cases, co-ordination of planning and management activities present few difficulties. What is a problem is the linkage with the national economic plan, which has already been mentioned. The second case is with countries which have different institutions to deal with different types of water use. In this case co-ordination of the water sector is a problem, and it is recommended that an effective co-ordinating institution be established. Secondly, they also have the task of linking with the national economic plans. It was noted that, in the case of shared water resources, though institutions have been established they are weak because they have not been supported with adequate financial and human resources. In view of the fact that these institutions are meant to deal with common socio-economic development issues of importance to the countries involved, every effort should be made to strengthen them with adequate funds and manpower. This is equally applicable to the various national institutions.

61. In general, countries should keep their institutions under constant review and establish new ones or amend existing ones in response to changing needs.

62. Attention was drawn to the operations of the international organizations at the subregional and regional levels. It was noted that these have not always been well defined and that to be very effective their efforts need to be co-ordinated. The role of the UNDP Resident Representative in this regard is crucial.

3. Legislation

63. It was noted that legislation has a direct link with the institutional arrangements. Two types of legislation can be seen to be involved, that dealing with water resources at the national level, and that dealing with internationally-shared water resources.

64. At the national level, whether the legislation covers the activities of centralized water institutions, or of several institutions, it addresses the question of rational, effective and equitable water allocation and water protection. Reasonable water tariff legislation in support of the provision and distribution of water should be promulgated, effectively supported and implemented. It is recommended that, since data on groundwater development and use and on water quality are particularly lacking, special legislation should be enacted to ensure that such data is collected and reported to a central body.

65. It is also recommended that national legislation be such that it is implementable and does not just remain on the statute books.

66. In the case of internationally shared water resources, including ground water, a number of protocols and conventions exist. Though these have been prepared for various common river and lake basins, they are often weak and ineffective. It is recommended that, in view of the common socio-economic benefits that these conventions and protocols are intended to bring to the countries concerned, every effort should be made to reactivate them. For countries which do not have such conventions and protocols, they should endeavour at the appropriate time to work out similar conventions.

4. Public participation

67. One of the constraints is lack of an awareness or appreciation of what public participation involves in its entirety. There has been the tendency to limit public participation to the rural areas. It is to be re-emphasised that this applies to the whole range from policy making, planning, implementation, monitoring to evaluation. All the actors need to be sensitized or made aware of this fact.

68. Women's involvement in public participation should be promoted, in particular, in view of their significant role in water collection and use, as well as in food crop production.

69. It has been the practice to plan from the top down. This does not make for good participation. Planning, project implementation and maintenance from the bottom upwards should be encouraged and there should be feedback or exchange of ideas between the top and the bottom. It is also noted that public participation has the great advantage of enabling appropriate technologies from the point of view of cost, operation and maintenance to be selected. It is to be noted that, if the right exchange of views between the planners and beneficiaries is achieved, costly and inappropriate choices will be avoided.

70. Public participation is not an easy concept to implement. Its realization requires strong institutional support. For instance, for small scale irrigation schemes, various arrangements like credit facilities, extension services and marketing are needed.

5. Assessment of water resources

71. This is one of the prerequisites for successful planning. The problems identified in 1976 are still present.

72. The constraints are, first, a lack of co-ordination and a repetition of work at the national, subregional and regional levels. Secondly, a lack of resources, particularly of manpower and finance, has frustrated the implementation of recommendations of the Action Plan.

73. There are inadequate networks of stations for monitoring the quantity and quality of surface and ground water and sediment transport. Even the networks which existed in 1977 have since deteriorated in a number of countries. Poor data collection from existing networks late processing and dissemination of data and the lack of data banks are common problems. Water balance elements have not been regionalised in many cases. Planning and design parameters have not been organized and analysed.

74. It is recommended that corrective measures be taken, and that the efforts of all institutions involved in water resources assessment be co-ordinated at the national level. Secondly, countries are strongly urged to consider using the UNESCO/WMO Guidelines for the evaluation of water resources assessment activities. It is believed this will reveal the national shortcomings in all aspects of assessment activities, and consequently show the way to improve the situation with or without external assistance.

75. A number of international organizations are involved in giving assistance to assess water resources at the sub-regional and regional levels. For this assistance to be effective their efforts need to be co-ordinated. ECA, UNESCO, and WMO should take the leadership in this effort.

B. EDUCATION TRAINING AND RESEARCH

1 Human resources

76. The participants recognized the lack of human resources as a major constraint in water resources management. It is recommended, therefore, that each country should assess these resources by publishing an inventory of national water engineers, scientists, technicians and other relevant experts.

2. Education and training needs

77. Within Africa, it is acknowledged that there are insufficient numbers of trained water resources personnel and that many are under-utilized. The national bodies responsible for water resources management should, therefore, implement a variety of new measures.

(a) educational and training requirements should be assessed and plans drawn up;

(b) African universities and polytechnics should include management, planning, water engineering and water related courses at both undergraduate and post-graduate levels;

(c) foreign institutions and international agencies should help strengthen the water resources training facilities in these universities and polytechnics;

(d) there is a need for improved and extended middle level human resources training. Where necessary, new regional training centres should be established.

(e) women, who hitherto have not been adequately catered for, should have access to training at many different levels covering the planning, implementation and maintenance of water resources projects;

(f) in-service training through workshops, seminars and short-courses should be encouraged at all levels;

(g) the special skills of trained human resources should be fully utilized. There should be flexibility in training and appropriate incentives provided after training, in order to keep trained personnel in areas where their expertise will be needed.

(h) specialized training or refresher courses should be provided periodically for researchers, managers and planners in water resources in order to update and refresh their skills.

3. Research needs

78. Not enough research is being carried out by institutions in African countries. It is recommended, therefore, that:

(a) research units should be established in the African water resources organizations;

(b) these should work in collaboration with universities and other institutions;

(c) a network of African centres for water resources studies, research and development should be set-up with international assistance and collaboration to encourage bilateral and regional co-operation;

(d) deliberate efforts should be made to develop and utilize indigenous consultants in water resources projects in Africa;

(e) information on research activities and findings should be stored, published and widely distributed, as for example through UNESCO AFRIWATER;

(f) research should be promoted and carried out in the following areas of common interest to the African region:

(i) climate variability and its effects on hydrology and water resources;

(ii) water resources assessment (particularly in the case of internationally shared water resources basins);

(iii) watershed management in the fight against land degradation (from overgrazing, inappropriate farming systems, bush fires and deforestation);

(iv) the use of appropriate technologies in the utilization and conservation of water resources;

(v) the exploration, exploitation and management of groundwater in the Basement Complex of the African Region.

4. Development of appropriate technology

79. Technological developments should take into account the resource base, the environment, production activities, financial constraints and operation and maintenance factors. The rapid development of the handpump in Africa in recent years is strongly commended. The following recommendations are also put forward:

(a) standardization of equipment with availability of spare parts;

(b) where possible, the local production or manufacture of equipment, machinery and spare parts should be encouraged;

(c) regular maintenance of equipment by the users;

(d) women should be trained to operate and maintain such equipment,

(e) the use of other technologies such as solar energy and wind power should be investigated in suitable areas.

5. Public information and extension

80. There is a need for greater dissemination of information to the public in general, and the rural communities, in particular, on all phases of water resources projects. This could be done through the INSTRAW/ILO/TURIN Centre multimedia modules, health education in schools, the mass-media and special water weeks involving public demonstration.

C. THE ROLE OF WATER RESOURCES IN NATIONAL SOCIO-ECONOMIC DEVELOPMENT

81. The importance of water resources in the socio-economic development of countries is well known. It has been emphasised in the Lagos Plan of Action, the OAU programmes, Africa's Priority Programme for Economic Recovery 1986-1990 and in the United Nations Programme of Action for African Economic Recovery 1986-1990, where its role in food production and combatting drought and desertification is highlighted.

82. In view of the paramount importance of water resources to all socio-economic activities, countries need to establish a set of balanced priorities for the development and optimal use of available resources. The following considerations should receive attention:

(a) development programmes should be rationalized to cater adequately for all sectoral demands;

(b) water resources programmes must identify all possible users and ensure complete co-ordination between the institutions involved in the various sectoral elements to optimize benefits;

(c) individual national considerations should determine priority water resources allocations;

(d) in determining these priorities, social benefits should have equal consideration with economic factors in project formulation, and an attempt must be made to quantify social benefits in the feasibility analysis of project proposals;

(e) women's role in agricultural production must be recognized; similarly they must be encouraged to participate at all stages of planning, execution and operation;

(f) technology transfer is extremely important, and was one of the methods put forward to ensure the effective implementation of the Action Plan. The standardization of plant and equipment, in order to reduce operation and maintenance costs is of critical importance. Although multilateral procurement practices aid standardization, bilateral agency methods often do not, since loans continue to be tied, despite the recommendation of 1977. It is recommended, therefore, that leading agencies liberalize their terms of lending in order to promote standardization and minimize costs to the country concerned.

1. Agricultural water use

83. The meeting put forward the following groups of recommendations with regard to agricultural water use;

(a) in formulating irrigation projects attention must be given to the production of staple food crops as well as cash crops;

(b) there should be a balance between small-, medium- and large-scale irrigation schemes;

(c) it is essential to modernize African agriculture. It is no longer possible for rural communities to feed the increasing populations by traditional means, involving the use of customary tools and low productivity methods. Appropriate technology must be introduced, aimed at easing the drudgery in peasant agriculture and at increasing the area under cultivation in order to increase production, and at inducing young people in urban areas to return to agriculture;

(d) in future, countries ought to ensure that project analysis contain the following elements:

(i) an evaluation of the data base and of relevant technical and socio-economic information;

(ii) social cost-benefit analysers;

(iii) the population-supporting capacity of the proposal;

(iv) a comparative analysis of national socio-economic policy;

(v) environmental impact, particularly in terms of health and food security.

(e) all countries are urged to aim at the formulation of a national strategy in which they should:

(i) assess the potential for irrigated agriculture with special reference to its short-, medium- and long-term role;

(ii) within the national framework, establish the appropriate priorities in the selection of irrigated areas;

(iii) establish national irrigation investment schemes;

(iv) prepare guidelines for the promotion and support of small-scale irrigation projects and of self-help initiatives;

(v) establish and strengthen those institutions responsible for the implementation of development policies;

(vi) allow all farmers, both men and women, equitable access to agricultural credit schemes;

(vii) provide incentives for increased production, including where appropriate, pricing and marketing stimulants;

(viii) develop adequate market structures.

(f) a strong appeal should be lodged with donor agencies to increase their support for development projects as opposed to emergency food aid;

(g) in view of the fact that health problems in rural areas of Africa, such as endemic vector-borne diseases can be associated with the development of irrigated agriculture and that good water management practices are a prerequisite to adequate environmental protection and vector control measures in irrigation, it is recommended that special programmes be developed aiming at:

(i) educating and training users and extension workers in the use of proper protection techniques;

(ii) increasing the awareness of policy makers and managers;

(iii) developing relevant research activities.

(h) in view of the scarcity of water resources and the need to use them efficiently, the re-use of effluents for irrigation should be considered, provided that potential health hazards and ground water contamination is avoided.

2. Community water supply

84. The following recommendations were adopted concerning this subject:

(a) the adequate provision of safe drinking water to both rural, urban and peri-urban population is essential. When different bodies are responsible for different groups of consumers, their activities must be co-ordinated;

(b) the urgent need for progress in this sector means that it is essential that irrigation plans include potable water supply and the education components to ensure its safe utilization. Furthermore, the energy needs of water supply in towns and larger rural centres should be included in electrification plans;

(c) funds commensurate with the importance of developing water resources are not allocated by governments, because of a shortage of funds within national economies caused largely by the national debt burden. Such debts may have yielded a better return if invested in the water sector. Countries should review their borrowing policies in order to ascertain possible adjustments which would liberate funds to the water sector.

3. Multi-purpose development of water resources

85. The meeting agreed that the development of multi-purpose projects needs emphasis, particularly with reference to hydroelectric and inland navigation schemes. Socio-economic feasibility is often increased by inter-country and regional co-operation; subregional and regional approaches should also be considered.

4. Water quality

86. The meeting considered that water legislation to protect water quality is essential. In this regard, governments should institute procedures for the continuous monitoring of water pollution from industrial users; this should include thermal pollution and the contamination of ground water by the dumping of industrial wastes.

5. Disaster preparedness

87. With regard to floods and droughts it was agreed that:

(a) countries should accelerate or establish early warning system capabilities in reference to floods and drought;

(b) inter-basin transfers, either at national or subregional level, could provide a means of combatting drought and desertification, and therefore, political and socio-economic feasibility studies for such transfers should be undertaken;

(c) governments should set aside the financial resources to establish and strengthen the various relevant data collecting networks and to enable necessary research on climatic variations in relation to flood and drought occurrence to be carried out. The efforts of the international organizations and bilateral agencies are recognized but the various countries must make their own contributions and ensure that basic infrastructures are in place and adequate;

(d) in view of the close links between drought, floods, desertification and the degradation of environment by the destruction of vegetation, it is recommended that greater emphasis be laid on watershed management and the restoration of the vegetal cover as a means to combat these phenomena;

(e) finally, member nations are called upon to draw up national action plans against drought and desertification in line with the regional plan of Action to Combat the Impacts of Drought in Africa, adopted in Resolution 599(XX) of the ECA Conference of Ministers.

D. ENVIRONMENTAL AND HEALTH ASPECTS

88. In order to combat the high incidence of diseases associated with poor water supply and sanitation, governments who have not already done so should require departments concerned with primary health care to urgently draw up lists for communities to be provided with safe water and adequate sanitation. These lists should give priority to communities which appear to have the highest incidence of schistosomiasis, guinea-worm disease and intestinal parasites (especially round worm and hook worm). Account should also be taken of communities with high infant mortality rates and those with high incidence of infantile diarrhoea. Rural areas and deprived urban communities, especially squatters and those occupying sub-standard housing, should be given preference. Preparation of priority lists should not be delayed because of lack of detailed statistics, but should be carried out with the greatest possible speed using any available evidence.

89. Governments should use their own resources and the facilities of women's groups, voluntary and community associations (including churches and other religious groups), the public media and all other means to intensify education programmes that explain the benefits of good water supply and sanitation. In addition the programmes should point out the association of disease and infant death with the following:

(a) poor quality drinking water;

(b) inadequate quantity of water for personal and household use;

(c) defecation in or near water, on open spaces or in poorly-constructed and badly-maintained latrines; and

(d) indiscriminate disposal of faeces and household wastes.

90. Programmes should encourage:

(a) the formation, support and training of local committees, which shall normally include a majority of women members, to plan and promote improvements to water supply and sanitation;

(b) the provision by householders and communities themselves of improved water supplies and household latrines;

(c) the proper utilization of water and latrines, including washing of hands after defecation and before preparation of food;

(d) the removal of spilled water from the immediate vicinity of wells, handpumps and public standpipes, using such spilled water for crops whenever possible; and

(e) proper disposal of stormwater, domestic wastewater (sullage) and solid waste.

91. To support the provision of safe and adequate community water supplies and sanitation governments should:

(a) encourage the posting of professional staff to priority areas and provide training for them in appropriate technology, management and social factors (such as the participation of local communities and especially women);

(b) provide, by adequate financial support, by recruitment and by training, a sufficient number of technicians to advise local communities and to carry out tasks which cannot be carried out by unskilled labour;

(c) provide training in construction, operation and maintenance for men and particularly women in communities;

(d) encourage the commercial manufacture, distribution and sale of material, components and equipment which communities or householders cannot provide themselves and plan the distribution of such materials, components and equipment provided by government, international, bilateral and voluntary agencies to priority areas; and

(e) strengthen the management functions of national and local institutions involved in water supply and sanitation (or create new institutions where none exist), giving particular attention to the financing of such institutions by the imposition of cost-related charges for piped water supplies and by other means.

92. Governments should provide or enhance facilities, including appropriate equipment and trained personnel, for sampling and analysis as follows:

(a) on-site testing of water used or intended for small community supplies in order to determine its microbiological, chemical and physical suitability for drinking;

(b) routine testing of discharges from industry, agriculture and other sources of pollution to surface and ground water, and

(c) regular and continuous monitoring of major rivers and sources of water supplies to large communities in respect of all parameters affecting the quality of the water, and the collating of such data and their dissemination to all departments and organizations for whom they are or might be relevant.

93. Governments should make strenuous efforts for the protection of the environment by:

(a) strengthening existing legislation (or formulating appropriate new legislation where none exists or where existing legislation is inadequate) for the control of pollution generally, and in particular for the control of pesticides and other toxic substances whose use is not permitted in their country of origin;

(b) enforcing relevant laws, regulations and orders;

(c) carefully considering the health and environmental effects of all proposed development schemes (environmental impact assessment), and particularly considering whether small-scale or large-scale schemes are likely to be more appropriate with regard to benefits and social, environmental and health disbenefits;

(d) encouraging the utilization of vegetable and animal wastes to sustain the fertility of agricultural and horticultural soils and as sources of energy, taking appropriate precautions to minimize the transmission of pathogenic organisms; and

(e) encouraging good management of irrigation works and the reuse of treated waste water for agriculture and arboriculture.

Agenda item 9: Future regional co-operation activities

94. A representative of the ECA secretariat, in introducing the short discussion paper prepared for this item, discussed some issues concerning regional co-operation between countries in the areas of shared water resources development, assessment of water resources, education, training and research, information exchange, and the environment.

95. Regional co-operation between United Nations bodies was also discussed including the establishment of a mechanism for co-ordinating and harmonizing activities at regional level and the possibility of mounting multi-agency, multi-disciplinary teams for advisory services to member States.

96. Finally, the question of the establishment of an Intergovernmental Committee on Water for the African region was discussed. It was suggested that pending the formation of such a committee, a regional meeting such as the present meeting could provide a mechanism for co-operation between member States and between international bodies.

97. The meeting noted that African member States were very conscious of the need to combine their efforts in strengthening regional co-operation and made the following recommendations:

(a) national governments should reinforce and where necessary reorganize their water resources institutions since the effectiveness of subregional or regional institutions is closely linked to the strength of the national infrastructures;

(b) a study should be undertaken by ECA, in collaboration with other United Nations organizations and agencies and other relevant Intergovernmental Organizations, to review the present and proposed regional co-operative arrangements, with a view to proposing the most feasible and practical means of enhancing co-operation in the field of water resources;

(c) the present regional meeting should be held every two years;

(d) countries sharing common water resources should endeavour to strengthen co-operation in the field of water resources development, and concerned United Nations and other international bodies should be urged to assist in such undertakings when requested by co-operating countries;

(e) the Economic Commission for Africa should investigate the possibility of publishing more technical information on water resources development to enhance information exchange between countries and organizations;

(f) because of the foreign exchange difficulties faced by African water resources personnel in purchasing publications from overseas, the United Nations system is requested to investigate ways and means of enabling the purchase of such professional publications in local currency;

(g) to the extent that the implementation of the African Priority Programme for Economic Recovery (APPER) will result in an increased flow of domestic and external resources, it is recommended that the Steering Committee for Co-operative Action for the International Drinking Water Supply and Sanitation Decade (IDWSSD) review the quality and quantity of support to activities to ensure a further impetus to accelerating progress in achieving the goals and objectives of the decade in Africa.

(h) ECA in co-operation with UNESCO and other organizations concerned should investigate the possibility of conducting a survey of national educational and training institutions in the region dealing with the field of water resources. Such a survey should also consider the use of suitable national institutions as regional or subregional training centres.

(i) member States are kindly requested to support and implement the establishment of a network or centre for water resources studies, research and development for Africa, as proposed by UNESCO and by the African Environmental Conference held in Cairo 16-18 December 1985.